BIOGRAPHICAL SKETCH

NAME **Naveen V. Thuramalla**	TITLE **Vice President, Regulatory Affairs**

EDUCATION/TRAINING *(Begin with baccalaureate or other initial professional education, such as nursing, and include postdoctoral training.)*

INSTITUTION AND LOCATION	DEGREE *(if applicable)*	YEAR(s)	FIELD OF STUDY
University of Kentucky, Lexington, KY	MS	2004	Mechanical Engineering
Osmania University, Hyderabad, AP, India	BE	2001	Mechanical Engineering
Regulatory Affairs Professionals Society	Certificate	2008	Online Medical Device Certificate
SoCRA	CCRP	2011	Clinical Research Certification
University of California, Irvine, CA	Certificate	2011	Medical Product Development

A. Positions and Honors.

Positions

2016-Present Vice President, Regulatory Affairs, **ARKRAY, Inc**., Edina, MN
2013-2016 Vice President, Engineering & Clinical Studies, **Transonic Systems, Inc**, Ithaca, NY
2015-2016 Board of Directors, **Transonic Systems Inc**, Ithaca, NY
2012-2016 Board of Directors, **Transonic Endogear Inc**, Sacramento, CA
2011-2013 Director of Clinical Studies & Regulatory Affairs, **Transonic Systems, Inc**, Ithaca, NY
2006-2011 Senior Scientist & Project Manager, R&D, **Transonic Systems, Inc**, Ithaca, NY
2004-2006 R&D Scientist, **Transonic Systems, Inc**, Ithaca, NY
2003-2004 Product Development Engineer, **Cardiojustable LLC**, Lexington, KY
2001-2003 Research Assistant, Center for Manufacturing, Mechanical Engineering Department, **University of Kentucky**, Lexington, KY
2001-2003 Teaching Assistant, Mechanical Engineering Department, **University of Kentucky**, Lexington, KY

Honors

2003 Young Researcher Award by Massachusetts Institute of Technology, Boston, MA
2003 Commonwealth Research Award by University of Kentucky, Lexington, KY
2003 Best Student Poster Award at TMS Annual Meeting
2003 Student Travel Assistance Scholarship by the Metals, Minerals and Materials Society to attend the TMS Annual Meeting
2001-2004 Kentucky Graduate Scholarship by University of Kentucky, Lexington, KY

Professional Membership

Member SCCM (Reviewer), RAPS, ASM (Editorial Board member), PMI, SoCRA

B.1. Selected peer-reviewed publications

1) Vigani A, Shih A, Queiroz P, Pariaut R, Gabrielli A, **Thuramalla N**, Bandt C. "Quantitative response of volumetric variables measured by a new ultrasound dilution method in a juvenile model of hemorrhagic shock and resuscitation". Resuscitation 2012, Vol: 83(8):1031-7.

2) Darling E, **Thuramalla NV**, Searles B, "Validation of Cardiac Output Measurement by Ultrasound Dilution Technique with Pulmonary Artery Thermodilution in a Pediatric Animal Model". Pediatric Cardiology 2011 2011, Vol: 32(5):585-589.

3) Shih A, Giguère S, Vigani A, Shih R, **Thuramalla N**, Bandt C, "Determination of cardiac output by ultrasound velocity dilution in normovolemia and hypovolemia in dogs". Vet Anaesth Analg. 2011, Vol: 38(4):279-285.

4) Krivitski NM, Kislukhin VV and **Thuramalla NV,** "Theory and in-vitro validation of a new extracorporeal approach for hemodynamic assessment in pediatric and neonatal ICU patients". Pediatric Critical Care Medicine Journal 2008, Vol: 9(4): 423-428.

5) **Thuramalla NV**, Douglas WI, Rachakonda P, Jacob JD and Knapp CF, "Determination of constricting forces required for an adjustable systemic-to-pulmonary artery shunt" Medical Device Materials II - Proceedings of the Materials and Processes for Medical Devices Conference 2004, Medical Device Materials II - Proceedings of the Materials and Processes for Medical Devices Conference 2004, 2005, pp. 307-311.

6) **Thuramalla NV**, Douglas WI, Knapp CF, "Effect of internal pressure on the force requirement for deforming a shunt to control flow for univentricular cardiac anomalies", Proceedings of the Second IASTED International Conference on Biomechanics, Proceedings of the Second IASTED International Conference on Biomechanics, 2004, pp. 124-129.

7) **Thuramalla NV**, Douglas WI, Rachakonda P, Jacob JD and Knapp CF, "Effect of plunger design on the constricting forces in an adjustable systemic to pulmonary artery shunt", Advances in Bioengineering, BED, Advances in Bioengineering - 2004, pp. 303-304, 2004.

8) AbuFarha FK, Deshmukh PV, **Thuramalla NV** and Khraisheh MK, "Superplastic Forming: Stretching the Limits of Fabricating Biomedical Devices and Implants" Proceedings of the ASM Materials & Processes for Medical Devices Conference, September 2003, Anaheim, CA, ASM International Publications, pp 368-373.

9) **Thuramalla NV**, Deshmukh PV and Khraisheh MK. "Multiscale analysis on the stability of Superplastic deformation," Materials Science Forum Vols: 447-448, pp.105-110, 2004.

10) **Thuramalla NV** and Khraisheh MK. Multiscale-Based Optimization of Superplastic Forming. Transactions of the North American Manufacturing Research Institute (NAMRI/SME), Vol: 32, pp 637-643, 2004.

11) Deshmukh PV, **Thuramalla NV**, AbuFarha FK and Khraisheh MK, "Integrated approach for optimization of Superplastic Forming", Proceedings of a Symposium on Advances in Superplasticity and Superplastic Forming, the 2004 Annual TMS meeting, Charlotte, NC, pp 361-369.

12) **Thuramalla NV** and Khraisheh M.K., "Optimum Variable Strain Rate Deformation Paths for Superplastic Forming of AA5083 Using Multiscale Stability Criterion", Proceedings of the Eighth ESAFORM Conference on Material Forming, Cluj Napoca, Romania, April 2005.

13) **Thuramalla NV**, Nazzal M. and Khraisheh M. K., "Variable Strain Rate Forming Technique to Optimize Superplastic Forming of AA 5083 Using Multiscale Stability Analysis", International Journal of Forming Processes, Vol: 10, pp. 45-65, 2007.

B.2. Selected Abstracts

1) E Darling, B Searles, **NV Thuramalla**, V Kislukhin and N Krivitski, “Accuracy of the new ultrasound dilution method to measure cardiac output in neonates and pediatrics: Animal validation”. Abstract # 50, 35(12), pg. A13; Critical Care Medicine, Dec 2007. Oral Presentation at the SCCM 37th. Critical Care Congress, Feb 2-6, 2008, Hawaii, USA.

2) **NV Thuramalla**, VK Kislukhin and NM Krivitski, “Novel ultrasound dilution technology to routinely measure blood volumes in pediatrics and neonates. (In vitro validation)”. Abstract # 0018; Intensive Care Medicine, S9, Vol. 33 Supplement 2, 2007. Oral Presentation at the 20th. ESICM Annual Congress, Oct 7-10, 2007, Berlin, Germany.

3) NM Krivitski, **NV Thuramalla**, VK Kislukhin, MF Callahan, E Darling, B Searles, AA Eremenko and PN Safarov, “Quantitative criteria for assessing haemorrhage using blood volumes measured by ultrasound dilution method”. Abstract # 0155; Intensive Care Medicine, S43, Vol. 33 Supplement 2, 2007. Poster Presentation at the 20th. ESICM Annual Congress, Oct 7-10, 2007, Berlin, Germany.

4) A Schulenberg, W Harmon, J Rubenstein, K Ragosta, E Darling, B Searles, **NV Thuramalla**, V Kislukhin and N Krivitski, "A novel method to measure cardiac output in the pediatric ICU: animal validation and preliminary clinical study", Abstract # 46; Critical Care Medicine, A12, Vol. 34 Supplement 12, 2006. Oral Presentation at the SCCM 36th. Critical Care Congress, Feb 16-21, 2007, Florida, USA.

5) M Callahan, V Kislukhin, **NV Thuramalla**, N Krivitski, T Smith, "Novel technique for estimation of hemodynamic status of rats during hemorrhage and resuscitation". Abstract # 908.24; The FASEB Journal, Vol. 21, 2007. Poster presentation at the Experimental Biology 2007, Washinton, DC.

6) M Callahan, V Kislukhin, **NV Thuramalla**, N Krivitski, T Smith, "Efficacy of blood volumes measurement to quantify hemorrhage and resuscitation". P169, Proceedings of 30th. Annual Meeting on Shock. Poster presentation at Shock 2007, Baltimore, MD.

7) RD Gleed, T Smith, M Callahan, E Darling, B Searles, V Kislukhin, **NV Thuramalla** and NM Krivitski, "Validation of novel ultrasound dilution cardiac output method for pediatric and neonatal patients". Abstract # 0659; Intensive Care Medicine, Vol. 32 Supplement 1, 2006. Poster presentation at the 19th. ESICM Annual Congress, Sep 24-27, 2006, Barcelona, Spain.

8) MF Callahan, **NV Thuramalla**, V Kislukhin, NM Krivitksi and T Smith, "Measurement of cardiac output in rats: using an extracorporeal AV loop with ultrasound dilution technology - a validation study". Abstract # 909.13; The FASEB Journal, Vol. 20 (5), 2006. Poster presentation at the Experimental Biology 2006, San Francisco, California.

9) **NV Thuramalla**, E Darling and B Searles, "Comparison of cardiac output (CO) measured by ultrasound dilution (UD) and thermodilution (TD) in a pediatric animal model”. Poster presentation at the World Summit on Pediatric and Congenital Heart Surgery Services, Education and Cardiac Care in Children and Adults with Congenital Heart Disease, June 19-21, 2008, Montreal, Canada.

10) **NV Thuramalla**, “First minimally invasive cardiac output (CO) and blood volumes (BV) monitor for routine use with pediatric ICU patients”. Poster presentation at the World Summit on Pediatric and Congenital Heart Surgery Services, Education and Cardiac Care in Children and Adults with Congenital Heart Disease, June 19-21, 2008, Montreal, Canada.

11) **NV Thuramalla**, MF Callahan, VK Kislukhin, NM Krivitski and TL Smith, "Measurement of cardiac output (CO) and blood volumes (BV) using ultrasound dilution (UD) method in neonates: Animal study". Poster presentation at the World Summit on Pediatric and Congenital Heart Surgery Services, Education and Cardiac Care in Children and Adults with Congenital Heart Disease, June 19-21, 2008, Montreal, Canada.

12) **NV Thuramalla**, MF Callahan, VK Kislukhin, NM Krivitski, T Smith, "Quantitative assessment of hemorrhage and resuscitation using ultrasound dilution method in a neonatal animal model". Poster Presentation at the PCICS Annual Symposium 2008, 7th. International Conference, December 2-6, 2008, Miami Beach, Florida.

13) E Darling, **NV Thuramalla** and B Searles, "Ultrasound dilution method to measure cardiac output in pediatrics." Oral Presentation at the 31st Annual Seminar of the American Academy Cardiovascular Perfusion, Jan 28- 31, 2010, Nashville, TN, USA.

14) V Kislukhin, **NV Thuramalla** and N Krivitski, "Automatic Identification of Shunts by COstatus PICU Monitor". Pediatric Critical Care Colloquium, Pittsburg, PA, USA, 15-17 May 2010.

15) A. Vigani, A. Shih, C. Bandt, R. Pariaut, P. Queiroz, **NV Thuramalla**, "Quantitative response of blood volumes in a juvenile hemorrhagic shock model". Abstract # 146; Intensive Care Medicine, S122, Vol. 36 Supplement 2, 2010. Poster presentation at the 23rd. ESICM Annual Congress, Oct 9-13, 2010, Barcelona, Spain.

16) V Kislukhin, **NV Thuramalla**, N Krivitski "Identification of Shunts Based on the Shape of the Dilution Curve" Abstract # 121. 3rd Congress of European Academy of Paediatric Societies (EAPS), Copenhagen, Denmark, Oct. 23-26 2010.

17) C Bandt , P Queiroz, A Vigani, R Pariaut, A DaCunha, **NV Thuramalla**, Udassi J, Shih A "Effects of norepinephrine on dynamic versus static variables of fluid responsiveness during hemorrhage and after resuscitation in a pediatric model". Poster presentation at the PCICS 2010, Dec 8-11, 2010, Miami Beach, FL, USA.

18) **NV Thuramalla**, V Kislukhin, N Krivitski "Normalizing Blood Volumes in Neonatal and Pediatric ICU Patients". Abstract # 220, Critical Care Medicine, Vol. 38 Supplement 12, 2010. Poster presentation at the 40th. SCCM Critical Care Congress, Jan 15-19, 2011, San Diego, CA, USA.

19) **NV Thuramalla**, V Kislukhin, N Krivitski "Normalizing Blood Volumes in Neonatal and Pediatric ICU Patients". Abstract # 220, Critical Care Medicine, Vol. 38 Supplement 12, 2010. Poster presentation at the 40th. SCCM Critical Care Congress, Jan 15-19, 2011, San Diego, CA, USA.

20) Shih A, MaisenbacherIII H, Vigani A, Estrada A, Pogue B, Berry C, Buckley G, **Thuramalla N**, Schrank H, Bandt C"Saline ultrasound dilution technique as a minimally invasive way to detect intra-cardiac shunt in an atrial septal defect model". Poster presentation at the 22nd. ESPNIC Medical and Nursing Annual Congress, Nov 2-5, 2011, Hannover, Germany.

21) Krivitski N, Kislukhin V, **Thuramalla N**, Kriksunov A "New Dilution Method for Qp/Qs measurement in patients with single ventricle (SV) Anatomy. Poster Presentation EAPS 2012, October 5-9, 2012, Istanbul, Turkey.

22) Badugu S, Fudge, Jr. JC, **Thuramalla N**, Lopez-Colon D, Udassi S, Rogers G, Shih Andre, Bleiweis M, and Udassi J. "Comparison of cardiac output measurements by ultrasound dilution and Fick method in cardiac catheterization laboratory patients". Pediatric Critical Care Medicine: June 2013 14(5) p S114. Abstract # 78

C. Patents

1) Co-Inventor of patent titled "**A System and Method for Redirecting Flow to Facilitate Measurement of Hemodynamic Parameters".** United States 8,273,048 B2

2) Co-Inventor of patent titled "**System and Methods for Determining Cardiac Output"**- Japan 4909982.

D**. Research Support**

2003-2004	Prototype of an Adjustable Systemic-Pulmonary Artery Shunt, NIH STTR Phase I Grant (1R41HL073506-01A1) [**Role: Co-Investigator**]
2004-2006	Cardiac Output Monitor for the Children's ICU, NIH SBIR Phase II Grant (2 R44 HL61994-03) [***Role: Co-PI***]
2005-2007	Pediatric Cardiac Monitor for Extracorporeal Life Support, NIH SBIR Phase I Grant (1 R43 HL082022-01) [***Role: Co-PI***]
2008-2011	Minimally Invasive Cardiac Monitor for Neonatal and Pediatric ICU, NIH SBIR Phase II Continuation Grant (2R44HL061994-04A2) [***Role: Co-PI***]
2008-2010	Pediatric Cardiac Monitor for Extracorporeal Life Support, NIH SBIR Phase II Grant (2R44HL082022-02) [***Role: Co-PI***]
2010-2014	Extravascular Lung Water Monitor for Children in ICU, NIH SBIR Phase I Grant (1R43HD062107-01A2) [***Role: Co-PI; Ongoing***]
2011- 2014	Bedside Monitor to Quantify Cardiac Shunt Flow in Newborns and Small Children, NIH SBIR Phase I Grant (1R43HD069311-01) [***Role: Co-PI; Ongoing***]